

## CLAIMS

What is claimed is:

1. A foundation pile apparatus for providing support to an above-ground structure, said foundation pile comprising:

a generally solid body having,

a top end wall,

a bottom end wall adapted for providing load bearing capacity, and

all around sidewalls extending between said top end wall and said bottom end wall, said sidewalls having a ridge extending generally about said sidewall and in a generally downward direction from said top end wall to said bottom end wall, wherein said ridge has an offset surface extending generally outward from a surface of said sidewalls, said offset surface providing additional load bearing capacity.

2. The apparatus of claim 1, wherein said ridge is a spiral ridge extending in a generally downward spiral direction about said sidewalls.

3. The apparatus of claim 1, wherein said sidewalls include a second spiral edge extending generally about said sidewalls.

4. The apparatus of claim 3, wherein said body is a precast concrete body formed to include two vertical section halves, said section halves mutually facing one another to create an offset surface that forms said spiral ridges.

5. The apparatus of claim 1, wherein said sidewall generally tapers radially outward from said top end wall to said bottom end wall.

6. The apparatus of claim 1, wherein said ridge extends spirally downward about said sidewall from said top end wall to said bottom end wall.

7. The apparatus of claim 1, wherein said body includes two spiral ridges, each said ridge extending spirally downward about said sidewall and traversing horizontally about said sidewall an arc distance of about 90°.

8. The apparatus of claim 1, wherein said body includes two spiral ridges, each with offset surfaces, said offset surfaces providing a load bearing surface that is between about .35 to .55 times the load bearing surface of said end wall.

9. The apparatus of claim 1, wherein said body has a generally round shape.

10. A method of installing foundation piles for supporting an above-ground structure, said method comprising the steps of:

providing a foundation pile apparatus having,

a top end wall,

a bottom end wall adapted for providing end bearing capacity, and

all around sidewalls extending between said top end wall and said bottom end wall, said sidewalls having a spiral ridge extending generally about said sidewall and in a spiral direction extending from said top end wall to said bottom end wall, wherein said spiral ridge has an offset surface providing additional load bearing capacity; and

driving the foundation pile apparatus into unexcavated earth a desired distance, including setting the apparatus to a desired depth, whereby said offset surface and said end wall support a load on said pile apparatus.

11. The method of claim 10, wherein said driving step includes applying a downward force upon said foundation pile, whereby said pile apparatus moves downwardly and rotatably into the unexcavated earth.

12. The method of claim 11, wherein said driving step includes driving the foundation pile such that the pile rotates about 1/4 turn for every given downward distance into the earth, said given downward distance corresponding to about the height of the pile.

13. The method of claim 11, wherein said step of applying a downward force rotates the pile such that the spiral ridge loosens the soils adjacent the pile as the pile is driven downwardly into the earth.

14. The method of claim 13, wherein said step of providing a pile apparatus includes providing a second spiral ridge about said walls, and wherein said offset surface generally faces the direction of rotation of the pile apparatus during the driving step.

15. A method of installing foundation piles for supporting an above-ground structure, said method comprising the steps of:

providing a concrete pile apparatus having a top end wall, a bottom end wall adapted for providing end bearing capacity, and all around side walls extending between said top end wall and said bottom end wall, said side walls having at least a pair of spiral ridges thereon that extends generally about a surface of said side wall and in a spiral direction extending from said top end wall to said bottom end wall, wherein each said spiral ridge has an offset surface extending generally outward from said surface of said sidewalls, said offset surface providing additional load bearing capacity to said concrete pile apparatus; and

applying a downward force to said concrete pile apparatus to drive the concrete pile apparatus into unexcavated earth a desired distance from the structure, including setting the apparatus to a desired depth whereby said spiral ridge provides additional load bearing capacity, and whereby said spiral ridge engages the unexcavated earth to cause said concrete pile apparatus to rotate as the concrete pile apparatus moves downwardly into the unexcavated earth.

16. The method of claim 15, wherein said step of applying a downward force causes the foundation pile to rotate about 1/4 turn for every given downward distance, said given downward distance corresponding to about the height of the pile.

17. The method of claim 15, further comprising the step of installing one or more concrete pile apparatuses atop the first concrete pile apparatus by repeating, with respect to one or more additional concrete pile apparatus, said steps of providing a concrete pile apparatus and applying a downward force thereto, whereby the total load bearing capacity of a pile system including the installed pile apparatuses includes load bearing capacity provided by offset surface areas of spiral ridges on each installed concrete pile apparatus.

18. A foundation pile apparatus for providing support to an above-ground structure, said foundation pile comprising:

a concrete body having

a top end wall,

a bottom end wall adapted for providing load bearing capacity, and

all around sidewalls extending between said top end wall and said bottom end wall, said sidewalls having two spiral ridges extending generally about said sidewall and in a generally downward spiral direction from said top end wall to said bottom end wall, wherein each said spiral ridge has an offset surface extending generally outward from a surface of said sidewalls, said offset surface providing additional load bearing capacity.

19. The apparatus of claim 18, wherein said concrete body is a precast concrete body formed to include two vertical section halves, said section halves mutually facing one another to create said offset surfaces that form said spiral ridges.

20. The apparatus of claim 19, wherein each said spiral ridge extends spirally downward about said sidewall and traverses horizontally about said sidewall an arc distance of about  $90^\circ$ , and wherein each said offset surfaces together has a load bearing surface of between about .33 times or greater than the load bearing surface of said end wall.

21. The foundation pile of claim 20, wherein said concrete body has a generally round shape.